In the claims:

Please amend the claims as follows:

1. (currently amended) An ~~downhole tool~~ apparatus for determining ~~the properties~~ a property of a fluid downhole comprising:

~~a downhole tool deployed in a well bore formed in an adjacent formation, the tool interacting with a downhole fluid;~~

a resonator associated with the fluid downhole ~~fluid~~;

a controller for actuating the resonator;

a monitor for receiving a response from the resonator to the actuation of the resonator such that the response is associated with the fluid; and

a processor for estimating the ~~a value of a~~ property for the fluid downhole ~~fluid~~.

2. (currently amended) The ~~downhole tool~~ apparatus of claim 1, ~~further comprising:~~ wherein the processor uses a chemometric equation for estimating ~~a fluid~~ the property ~~value~~.

3. (currently amended) The downhole tool of claim ~~1~~2, ~~further comprising:~~ wherein the processor applies ~~a function applying~~ the resonator response to a the chemometric equation to determine ~~a~~ the ~~fluid~~ property ~~value~~.

4. (currently amended) The ~~downhole tool~~ apparatus of claim 1, ~~further comprising:~~ wherein the processor uses a function for deriving a chemometric equation from measured resonator response correlated with known fluid property values.

5. (currently amended) The ~~downhole tool~~ apparatus of claim 1, wherein the ~~parameter value~~ property is viscosity.

6. (currently amended) The ~~downhole tool~~ apparatus of claim 1, wherein the ~~parameter value~~ property is density.

7. (currently amended) The ~~downhole tool~~ apparatus of claim 1, wherein the ~~parameter value~~ property is dielectric constant.

8. (currently amended) The ~~downhole tool~~ apparatus of claim 1, wherein the ~~parameter value~~ property is resistivity.

9. (currently amended) The ~~downhole tool~~ apparatus of claim ~~1~~ 2, ~~further comprising:~~ wherein the processor ~~applying~~ applies the chemometric estimated ~~parameter value~~ property to a Levenberg-Marquardt (LM) algorithm to determine a fluid parameter value for the fluid.

10. (original) The downhole tool of claim 10, wherein the fluid parameter value comprises a global minimum for the LM algorithm.

11. (currently amended) A method for determining ~~the~~ a ~~properties~~ property of a fluid downhole comprising:

~~deploying a tool in a well bore formed in an adjacent formation;~~

interacting with a downhole fluid with a resonator ~~associated with the tool~~;

actuating the resonator;

receiving a response from the resonator to the actuation of the resonator ~~associated with the fluid~~; and

estimating a value of a the property of the fluid downhole ~~fluid~~ based on the resonator response.

12. (currently amended) The method of claim 11, further comprising:

estimating a the fluid property ~~value with~~ using a chemometric equation.

13. (currently amended) The method of claim 11, further comprising:

applying the resonator response to a chemometric equation to determine a the ~~fluid~~ property ~~value~~.

14. (original) The method of claim 11, further comprising:

deriving a chemometric equation from measured resonator response correlated with known fluid property values.

15. (currently amended) The method of claim 11, wherein the ~~parameter value~~ property is viscosity.

16. (currently amended) The method of claim 11, wherein the ~~parameter value~~ property is density.

17. (currently amended) The method of claim 11, wherein the ~~parameter value~~ property is dielectric constant.

18. (currently amended) The method of claim 11, wherein the ~~parameter value~~ property is resistivity.

19. (currently amended) The method of claim ~~11~~ 12, further comprising:
applying the chemometric estimated parameter value to a Levenberg-Marquardt (LM) algorithm to determine a fluid parameter value for the fluid.

20. (currently amended) The method of claim 19, wherein the ~~LM algorithm calculated~~ fluid parameter value comprises a global minimum for the LM algorithm.

21-30 (cancelled)

31. (original) A system for determining the properties of a fluid comprising:
a surface controller for lowering a down hole tool deployed in a well bore formed in an adjacent formation, the tool interacting with a down hole fluid;
a resonator associated with the down whole fluid;
a controller for actuating the resonator;
a monitor for receiving a response from the resonator to the actuation of the resonator such that the response is associated with the fluid; and
a processor for estimating a value of a property for the down whole fluid.

32. (new) The system of claim 1, further comprising:
wherein the processor uses a chemometric equation for estimating a fluid the property value.

33. (new) The system of claim 12, further comprising: wherein the processor applies a function applying the resonator response to a the chemometric equation to determine a the fluid property value.

34. (new) The system of claim 1, further comprising:
wherein the processor uses a function for deriving a chemometric equation from measured resonator response correlated with known fluid property values.

35. (new) The system of claim 1, wherein the parameter value property is viscosity.

36. (new) The system of claim 1, wherein the parameter value property is density.

37. (new) The system of claim 1, wherein the parameter value property is dielectric constant.

38. (new) The system apparatus of claim 1, wherein the parameter value property is resistivity.

39. (new) The system of claim 12, further comprising:
wherein the processor applying applies the chemometric estimated parameter value property to a Levenberg-Marquardt (LM) algorithm to determine a fluid parameter value for the fluid.

40. (new) The system of claim 10, wherein the fluid parameter value comprises a global minimum for the LM algorithm.